

Feed Management and Net Returns in Broiler Farming in South Konawe District of Southeast Sulawesi

Ning Silistiyani¹, Bahari Bahari², Samsul Alam Fyka³, Haji Saediman^{4*}

^{1,2,3,4}Department of Agribusiness, Faculty of Agriculture, Halu Oleo University, Kendari, Indonesia

Abstract: Broiler chicken farming is often considered a promising enterprise, but its successful operation requires farmers' ability to manage feed allocation efficiently and effectively in order to minimize cost and increase income. This study aims to: (1) comprehend the management of broiler chicken feed distribution, and (2) ascertain the magnitude of net returns from broiler chicken farming. This research was conducted in Boro Boro Lameuru Village, West Ranomeeto Subdistrict, South Konawe District, in August 2022. The data were analyzed using qualitative descriptive analysis to depict feed management, and cost and returns analysis to determine farmer earnings. Research findings reveal that feed management encompasses: a) feed quantity determination, b) feed restriction during the final phase of rearing, and c) the establishment of appropriate feeding schedules. The average net returns of broiler chicken farming per production cycle amounts to Rp 17,205,987, which is a notable indicator of the economic viability of broiler farming in the area. This result contributes to a more comprehensive understanding of the interplay between feed management efficacy and the financial prospects of broiler farming.

Keywords: Broiler, farming, feed management, profitability, returns.

1. Introduction

The poultry business contributes significantly to the world's supply of meat and eggs, making it a vital and active aspect of international agricultural endeavors. Due to their nutritional value, poultry products are widely accepted in society and are essential in addressing issues with food security. Broiler chicken farming has become a crucial and lucrative business within this diversified industry, distinguished by its quick returns and possibilities for income generation. These qualities have drawn a lot of attention since they help farmers support their families and significantly boost the local and global economies [1], [2].

The significance of the poultry industry in Indonesia is highlighted by its role in providing essential animal protein to the population. Poultry sector can help increase the consumption of animal food, which is still far below the required level of 264 kcal to support the nutrition and health requirements for developing high-quality human resources [3], [4]. Poultry products, such as meat and eggs, have become

dietary mainstays and improved the nation's nutritional status. Broiler chicken farming is one of the more significant subsectors of the Indonesian poultry industry. The attractiveness of broiler farming's profitability has given rise to diverse farming arrangements, including contract-based models, designed to ensure consistent and reliable returns [5], [6].

Southeast Sulawesi is one of broiler chicken producing regions, demonstrating the complex interaction between animal production and societal demography. Despite not being a priority commodity [7], broiler farming is growing within this province, benefitting from an environment conducive to rapid growth, high productivity, and increased demand for chicken meat. The economic significance of broiler farming in Southeast Sulawesi underscores its role in addressing both food security and poverty alleviation concerns [8]-[10]. Significant benefits like cost-effectiveness, faster production cycles, and effective feed-to-meat conversion ratios have made broiler farming a promising agribusiness venture.

In broiler farming, feed management is a significant factor in determining profitability. The cost of feed often constitutes the predominant expense [11]-[13]. In addition, the competition between human and animal consumption has led to fluctuations in ingredient availability and price increases, necessitating prudent feed management strategies [14]. Techniques such as feed restriction and alternative ingredient adoption have been identified as key tools for increasing profitability in the chicken industry [15]. However, achieving optimal feed efficiency requires a delicate balance, as poor feed management can adversely affect production parameters, such as egg size, shell quality, growth, and mortality rates [16].

This paper explores the feed management and net returns in broiler farming in South Konawe District of Southeast Sulawesi province based on a survey in a broiler chicken producing village. By assessing various feed management techniques and the level of net returns, this study seeks to contribute to the understanding of poultry agribusiness dynamics and provide insights for optimizing feed-related practices in pursuit of sustainable and profitable broiler farming.

*Corresponding author: saediman@yahoo.com

2. Materials and Methods

The research was conducted in August 2022 in broiler chicken farming enterprises located in Boro-Boro Lameuru Village, West Ranomeeto Sub-District, South Konawe District. The selection of the research site was deliberate (purposive) as the village is a broiler producing village strategically located close to Kendari, the provincial capital. The survey involved a sample of 14 broiler chicken farmers. Both primary and secondary data sources were employed for data collection. Research data were gathered through interview techniques, involving direct question-and-answer sessions with respondents utilizing a questionnaire-based checklist. The research variables consisted of feed restriction, feeding schedule, feed quantity, feed costs, and net returns. Data analysis employed to address the research objectives were qualitative descriptive analysis and cost and returns analysis [17], [18].

3. Results and Discussion

A. Feed Management

Feeding commences after the chicks are released from the brooding area. Feed is the most significant factor, both in terms of cost and its impact on the increase in chicken weight itself [19]. The following presents the feed management applied by the farmers in the survey village.

1) Feed restriction

Feed restriction involves reducing the amount of feed administered by farmers during the final phase of rearing period with the purpose of preventing feed wastage in the event of sudden harvesting, as the timing of harvesting is determined by partner enterprises. Feed restriction can be executed through methods such as reducing feed quality, intermittent fasting on specific days, lowering the nutritional content of feed, and limiting the quantity of rations provided daily.

Another reason farmers impose feed restriction towards the end of the rearing period is to cut back on the usage of inefficient feed and lower feed expenses. As stated by Muharlieni *et al.* [20], feed restriction can be applied throughout the finisher period because by this stage, the development of visceral organs has reached maturity, thus feed restriction will have minimal impact on chicken growth. Feed limitation at this stage is a possible option for farmers because feed consumption frequently exceeds needs throughout the finisher period and body weight gain is generally moderate.

2) Feeding schedule

Feeding is conducted twice a day during the starter phase. In the morning, feed is provided when the air is cool and the temperature outside is not too hot, allowing the feed's energy to be used effectively for the growth of the chicken. Alternatively, feeding might take place in the evening after sunset. In the finisher phase, feed is given in the morning, afternoon, or evening.

High temperatures often lead to increased body temperatures in chickens, and as homothermic animals, they use physiological processes like panting to control their body temperature. For this reason, farmers avoid feeding during the

daytime. Providing feed during hot conditions can impose an additional heat load on chickens' bodies and elevate stress due to heat stress [21], a phenomenon supported by the findings of Mashaly *et al.* [22], indicating that feeding at high temperatures adversely affects the digestibility of protein for growth.

Enhancing feed management is essential, as the feeding behavior of chickens is influenced by environmental conditions. Feeding should take place when appetite is high and the environment is comfortable. Comfortable conditions lead to increased ration consumption and efficient ration utilization. However, during heat stress, chickens consume less of their food, and ration utilization becomes inefficient because energy is being diverted to relieve heat load. Prolonged periods of comfort affect ration utilization efficiency, allowing for the best possible energy use from rations for productivity. Energy from ration is conserved for optimal productivity rather than being utilized for heat loss to stabilize body temperature. Therefore, feeding should be done in the morning or evening.

3) Feed quantity

The amount of feed given to livestock varies depending on the population of livestock kept by farmers and the appetite of the animals in those conditions. The amount of feed consumed by chickens is influenced by several factors, such as the animals' health, body weight, season or weather, sex, daily physical activity, temperature in and around the coop, ration quality, used processing methods, and the housing system. Knowing the ration's metabolic energy content is necessary to satisfy the needs of the hens according to their developmental phases. Broiler chickens can adjust their feed consumption to a certain limit to acquire sufficient energy for optimal body growth [23].

B. Costs and Net returns

1) Fixed costs

Fixed costs are expenses incurred by farmers that remain constant or generally do not change regardless of whether production levels rise or fall. This is consistent with Soekartawi's viewpoint [24] that fixed costs are expenses that producers or entrepreneurs incur on a regular basis and whose amount is unchanged by output levels. Examples of fixed costs are coop depreciation, land rent for farmers who do not own land, equipment depreciation, and employee salaries.

Table 1
Depreciation cost in broiler farming in the survey village

No.	Description	Coop (Rp/year)	Tools (Rp/year)	Fixed cost (Rp/year)
1	Highest	3,541,666	411,710	3,953,390
2	Lowest	1,944,444	176,125	2,171,494
3	Average	2,740,124	297,229	3,037,361

Source: Field survey results, 2022

Table 1 presents the depreciation costs incurred by broiler chicken farmers. The highest depreciation cost for coops amounts to Rp3,541,666, while the lowest is Rp1,944,444, resulting in an average depreciation cost of Rp2,740,124. For equipment depreciation, the highest average cost is Rp297,229, and the lowest is Rp176,125, yielding an overall average equipment depreciation cost of Rp297,229. Meanwhile, the

total cost for the highest category is Rp3,953,390, and for the lowest category, it is Rp2,171,494. Thus, the average fixed costs incurred by broiler chicken farmers amount to Rp3,037,361.

2) Variable costs

The components of variable costs in broiler chicken farming in the survey village encompass costs for day-old chicks (DOC), feed, charcoal, vaccines and medications, brown sugar, labor, rice husks, and electricity. The following outlines the variable cost components incurred during the most recent rearing period by broiler chicken farmers.

Table 2
Variable costs of broiler farming in the survey village

No.	Description	Variable Cost (Rp/Period)
1	Highest	129,869,000
2	Lowest	64,219,250
3	Average	96,381,870

Source: field survey results, 2022

A thorough examination of the variable costs each production cycle, as shown in Table 2, demonstrates a wide range of expenses among producers of broiler chickens. The data shows a range of expenditures, with the highest category of variable cost reaching Rp129,896,000 and the lowest category amounting to Rp64,219,250. This broad range highlights the industry's inherent heterogeneity as farmers negotiate a complicated web of inputs, market factors, and management techniques.

The average variable cost of Rp96,318,870 serves as a key statistic for assessing the economic effectiveness of broiler chicken production. This average cost represents the total amount of money needed to support each production cycle. Individual farmers can use it as a benchmark to evaluate their own variable cost structures, find potential areas for cost savings, and improve the financial viability of their operations. This study advances knowledge of the complex financial aspects of raising broiler chickens by diving into the nuances of variable costs and their effects.

3) Revenue

Revenue is the total amount realized from the sale of broiler chickens and their droppings over the course of a single production season. Revenue from broiler chicken farming can be divided into two categories: primary production results from selling broiler chickens, and secondary income stems from selling chicken waste or litter, which is in demand by growers of vegetables and other crops. The following table provides an overview of the revenue from broiler chicken farming during a single production season in the survey village.

Table 3
Revenue of broiler farming

No.	Description	Broiler (Rp)	Feces (Rp)	Revenue (Rp)
1	Highest	169,393,848	475,000	169,843,848
2	Lowest	77,678,928	200,000	77,878,908
3	Average	116,323,418	301,786	116,625,204

Source: Field survey results, 2022

Table 3 reveals that the average revenue from selling broiler chickens in the highest category amounts to Rp 169,393,848,

and the lowest is Rp77,678,928, with an overall average of Rp116,323,418. As for the sale of chicken waste (feces), it amounts to Rp475,000 in the highest category, and Rp200,000 in the lowest category, resulting in an overall average revenue from feces of Rp301,786. Based on the data from the sales of broiler chickens and feces, the total revenue for broiler chicken farmers is Rp169,843,848 in the highest category and Rp77,878,908 in the lowest category, with an overall average total revenue for all farmers amounting to Rp116,625,204.

4) Net returns

The difference between total revenue and total costs over the course of a single production period constitutes the net returns of broiler chicken farmers. Farmers can achieve greater profits as the derived difference increases. This shows that the company is viable for continued growth with much greater potential. The net income of broiler chicken farmers over a recent production period in the survey village is in Table 4.

Table 4
Net returns of broiler farming

No.	Description	Revenue (Rp/Period)	Total Cost (Rp/Period)	Income (Rp/Period)
1	Highest	169,843,848	133,610,143	36,233,705
2	Lowest	77,878,928	67,027,645	9,014,272
3	Average	116,625,204	99,419,216	17,205,987

Source: Field survey results, 2022

According to Table 4, the average net returns each production cycle is Rp17,205,987, with the highest income being Rp36,233,705 and the lowest income being Rp9,014,272. This amount is calculated by deducting the entire cost from all revenues. Total revenues and costs have an impact on the net returns. Broiler chickens and their waste are sold for a profit, and total costs encompass all of the costs farmers incur during the rearing process, including both fixed costs and variable costs as chicks (DOC), feed, rice husk, medications, and vaccines. The interplay between these factors influences the net returns, making it crucial for farmers to carefully manage both revenue generation and cost control to optimize their financial outcomes.

The analysis of broiler farming's net returns has ramifications that extend beyond particular production cycles. It emphasizes the significance of efficient feed management as a key driver of profitability and the value of operational strategies that maximize revenues while minimizing costs. This study advances knowledge of how feed management strategies and financial concerns interact to influence the economic environment of broiler farming by examining the intricacies of net returns.

4. Conclusion

The feed management practices implemented by broiler chicken farmers involve (a) restricting feed provision during the late stage of rearing, (b) providing feed at appropriate times, namely in the morning and evening, and (c) determining the amount of feed given according to the nutritional needs of the broiler chicken. Total income represents the earnings received by farmers from the sale of chickens and the sale of feces. The

average income of broiler chicken farmers is Rp17,205,987 per rearing period.

Acknowledgment

The authors extend their gratitude to the broiler chicken farmers who generously dedicated their time to engage in discussions with the researchers and respond to all inquiries during the interview sessions.

References

- [1] M. Kabir, M. Asaduzzaman, and D. Dev, "Livelihood Improvement through Family Poultry Farming in Mymensingh District," *J. Bangladesh Agric. Univ.*, vol. 13, no. 2, pp. 247–254, 2016.
- [2] M. A. Hamid, M. A. Rahman, S. Ahmed, and K. M. Hossain, "Status of poultry industry in Bangladesh and the role of private sector for its development," *Asian J. Poult. Sci.*, vol. 11, no. 1, pp. 1–13, 2016.
- [3] Government of Indonesia and FAO, National Medium-Term Priority Framework (NMPF) 2010-2014 for Indonesia's External Assistance in the Agriculture Sector (incl. Forestry & Fisheries). Jakarta: Bappenas, 2009.
- [4] E. Niu, H. Saediman, and Sumi, "Break Even Analysis of Poultry Egg Production in Rural Area in Southeast Sulawesi," *Binus Bus. Rev.*, vol. 7, no. 3, pp. 227–232, 2016.
- [5] M. S. R. Chowdhury and M. M. Chowdhury, "Profitability analysis of poultry farming in Bangladesh: A case study on Trishal upazilla in Mymensingh district," *Dev. Ctry. Stud.*, vol. 5, pp. 107–114, 2015.
- [6] A. Saha, S. Sharmin, and M. Jahan, "Measuring the Profitability of Small Scale Poultry Producers through Contractual System in Bangladesh," *Am. J. Food Sci. Technol.*, vol. 9, no. 3, pp. 90–95, 2021.
- [7] H. Saediman, "Prioritizing Commodities in Southeast Sulawesi Province of Indonesia Using AHP based Borda Count Method," *Asian Soc. Sci.*, vol. 11, no. 15, pp. 171–179, 2015.
- [8] E. A. Awad, I. Zulkifli, A. F. Soleimani, and T. C. Loh, "Individual non_essential amino acids fortification of a low-protein diet for broilers under the hot and humid tropical climate," *Poult. Sci.*, vol. 94, no. 11, pp. 2772–2777, 2015.
- [9] H. Saediman, M. A. Limi, Rosmawaty, P. Arimbawa, and Y. Indarsyih, "Cassava consumption and food security status among cassava growing households in southeast sulawesi," *Pakistan J. Nutr.*, vol. 15, no. 12, pp. 1008–1016, 2016.
- [10] H. Saediman, S. Tanggapi, Bahari, L. Yunus, S. Abdullah, and S. A. A. Taridala, "Management Characteristics of Small-Scale Beef Cattle Production in Konawe District of Southeast Sulawesi," *Biosci. Res.*, vol. 16, no. 4, pp. 3854–3860, 2019.
- [11] B. T. Anang, C. Yeboah, and A. A. Agbolosu, "Profitability of broiler and layer production in the bring Afro region of Ghana," *ARNP J. Agric. Biol. Sci.*, vol. 8, no. 5, pp. 423–430, 2013.
- [12] L. Geo, H. Saediman, and W. O. R. Ariani, "Profit and Financial Feasibility Analysis of Broiler Chicken Livestock in South Konawe District, Indonesia," *IOP Conf. Ser. Earth Environ. Sci.*, vol. 465, p. 012059, May 2020.
- [13] O. J. Ogunnusi, C. O. Toye, and A. A. Akinwemoye, "Feed management as a paradigm for profitable poultry enterprise," *Anim. Res. Int.*, vol. 20, no. 1, pp. 4684–4693, 2023.
- [14] M. Mengesha, "The issue of feed-food competition and chicken production for the demands of foods of animal origin," *Asian J. Poult. Sci.*, vol. 6, no. 3, pp. 31–43, 2012.
- [15] S. M. Hassan, M. E. Mady, A. L. Cartwright, H. M. Sabri, and M. S. Mobarak, "Effect of early feed restriction on reproductive performance in Japanese quail (*Coturnix coturnix japonica*)," *Poult. Sci.*, vol. 82, no. 7, pp. 1163–1169, 2003.
- [16] J. O. Oyedeji, A. M. Orheruata, and M. Omatsuli, "Effects of feed rationing on the laying performance of 40-weeks in-lay hens," *J. Food, Agric. Environ.*, vol. 5, no. 3/4, pp. 301–303, 2007.
- [17] H. Saediman, A. Amini, R. Basiru, and L. O. Nafiu, "Profitability and Value Addition in Cassava Processing in Buton District of Southeast Sulawesi Province, Indonesia," *J. Sustain. Dev.*, vol. 8, no. 1, pp. 226–234, 2015.
- [18] H. Saediman, L. O. Alwi, I. S. Rianse, S. A. A. Taridala, and S. Salahuddin, "Comparative Profitability of Melon and Watermelon Production in South Konawe District of Southeast Sulawesi," *WSEAS Trans. Bus. Econ.*, vol. 17, pp. 933–939, 2020.
- [19] R. Fadillah, *Super Lengkap Beternak Ayam Broiler*. Jakarta: PT Agromedia Pustaka, 2013.
- [20] Muharlien, Achmanu, and K. A., "Efek Lama Waktu Pembatasan Pemberian Pakan terhadap Performans Ayam Pedaging Finisher," *J. Ternak Trop.*, vol. 11, no. 2, pp. 88–94, 2010.
- [21] E. Rahmawati, E. Suprijatna, and D. Sunarti, "Pengaruh Frekuensi Pemberian Pakan dan Awal Pemberian terhadap Performa Ayam Buras Super," *J. Sains Peternak. Indones.*, vol. 11, no. 2, pp. 152–164, 2017.
- [22] M. M. Mashaly, G. L. Hendricks, M. A. Kalama, A. E. Gehad, A. O. Abbas, and P. H. Patterson, "Effect of heat stress on production parameters and immune responses of commercial laying hens," *Poult. Sci.*, vol. 83, pp. 889–894, 2004.
- [23] R. D. Avisnu, "Pengaruh Frekuensi Pemberian Pakan terhadap pertambahan Berat Badan Ayam Broiler di Peternakan Bapak Erwin Bagus Desa Bandarasi Kecamatan Ngoro Kabupaten Mojokerto," Universitas Airlangga, 2016.
- [24] Soekartawi, *Analisis Usahatani*. Jakarta: Universitas Indonesia Press, 2016.